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26. RECORD OF NEW FISHES FROM PERIYAR TIGER RESERVE

The Periyar Lake, a man-made impoundment and associated streams are situated within the Periyar Tiger Reserve (9° 15' to 9° 40' N; 76° 55' to 77° 25' E) of Kerala. The lake has a total area of 26 sq. km, and two third-order streams, namely Mullayar and Periyar debouch into the reservoir. The lake and associated streams support a diverse fish fauna.

As a part of the study on the structure of fish communities in the lake and associated streams, fishes were collected seasonally from the lake and streams during May, 1994 and April, 1995. The analyses of fish collections revealed the presence of six new species of fishes in the Periyar Lake which were not listed in the earlier investigations (Raj 1941a, b; Chacko 1948) in this area.

The following is the list of new fish species:

1. *Cyprinus carpio communis* Linnaeus
2. *Oreochromis mossambicus* (Peters)
3. *Garra mcClellandi* (Jerdon)
4. *Bhavania australis* (Jerdon)
5. *Noemacheilus guentheri* Day
6. *Travancoria jonesi* Hora

Of these, *C. carpio communis* and *O. mossambicus* are exotic and were distributed abundantly in the lake. Since no records are available with the Forest and Fisheries Departments of the State about the introduction of these exotic species, these fishes are considered to be "accidentally introduced" during the last few decades. Another fish species *G. mcClellandi,* which was distributed both in the lake and streams, has only been reported from Cauvery basin (Talwar and Jhingran 1991). The rest were loaches distributed rarely in the stream and in the confluence zone, where the streams join the lake. Silas (1952) noted the presence of *N. guentheri* and *T. jonesi* in the high range of Travancore which were collected from different streams that drain outside the Periyar Tiger Reserve. One of the rare loaches collected from Periyar, *T. jonesi* has been considered as endangered (Menon 1993). The specimens are kept in the Wildlife Biology Division of Kerala Forest Research Institute.

Acknowledgements

The project is supported by the Wildlife Wing of the Kerala Forest Department and we thank the Officials of the Department for their kind co-operation and the Director of KFRI for constant encouragement and guidance.

August 8, 1995

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27. BIOLOGY OF *ALTICA COERULEA* (OLIV.) (CHRYSOMELIDAE: COLEOPTERA) — A POTENTIAL BIO-CONTROL AGENT AGAINST *JUSSIAEA REPENS* L.

(With two text-figures)

The present communication deals with the first report on the larvae and adults of leaf beetle, *Altica coerulea* (Oliv.) (Fig. 1a, b) (Order Coleoptera, Family Chrysomelidae, sub family Alticinae) as a potential bioagent for the control of water primrose *Jussiaea repens* L. in the water bodies of fisheries interest. Studies carried out at the Central Institute of Freshwater Aquaculture, Kausalyaganga indicate that the larvae and adults of the beetle do not attack

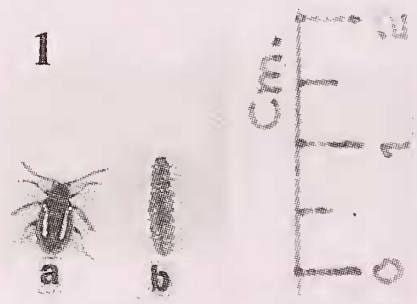

Fig. 1.a. Imaginal and b. larval form of the leaf beetle, *Altica coerulea* (Oliv.).
Fig.2. Control of *Jussiaea* in a fish pond by leaf beetle.

any other plant of economic importance. The entire life cycle of this beetle is completed within 62-78 days in the spring (at temperature range 16.0-35.5°C). Elongated yellow eggs (Size 93-94 µm x 36-38 µm) are laid horizontally in patches (8-11 patches) on the ventral side of the host leaves for 72 hours consecutively. The dull black 1.5-1.7 m larva hatches out after 6-7 days of incubation and starts feeding voraciously on the tender parts of the *Jussiae* plant. This larva grows up to 9-11 mm in 21 days, when it can consume 31-39 mg of leaves and tender stems per day (i.e. nearly 250-280% of their body weight). At dearth of fresh leaf as a result of total grazing by themselves, larvae bore into the stem wall and excavate tunnels along its length, sometimes traversing internodes, making larval galleries, where they may eventually pupate. After actively feeding for 21-24 days full-grown larvae (12-14 mg) become bowed and cease feeding for one day, then they undergo pupation. The event takes place nakedly by means of a split down the pre-abdomen and the pupa gradually works the larval skin forwards until it forms a crumpled mass at the oral extremity. The light yellow coloured pupae (9-10 mg) metamorphose into adults in about 4 days. The image is 5-6 mm long and 13-15 mg in weight. There is little difference between adult males and females, the males are comparatively small and metallic violet-black in colour, while females are metallic greenish black. Life span (at 16.0°-35.5°C) is over 57 days. Aestivation occurs in moist places under grass clumps and dry leaves on ground. The beetles migrate to nearby infested water bodies, only when the host plants become meagre. They are hardy and vigorous defoliators, making holes in leaves (consumption per day 16-24 mg/beetles). Artificial hibernation over 50 days can be imposed by keeping them at low temperature (4-5°C) in a closed moist bottle, with complete resumption to normal life when